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Abstract

DETERMINATION OF RATIO OF U-235 AND U-238 IN URANIUM

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A method to determine the isotopic ratio of U-235 and U-238 in uranium samples by measuring the build-up of their beta active daughters, Th-231 and Th-234, is considered. These daughter products are quantitatively separated in the carrier-free state in an anion exchange column and estimated using a flow counter. The accuracy of the method depends essentially on the total beta counts recorded for estimation. The results presented in the paper were computed from experiments recording about million counts in each case. These observations are then used to establish half-lives of the beta active daughters of pure uranium. From this study isotopic ratios of U-235 and U-238 are determined in the uranium sample.

A number of natural uranium, depleted and enriched uranium samples from different countries were analysed using this method and the results are presented. The paper discusses the merits of the method in comparison with other methods available for isotopic estimation of uranium.

Systematic variations in the ratios of U-235 and U-238 in natural uranium samples from different ores and uranium concentrates have been observed in these experiments.